

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | |
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| Applicant's or agent's file reference C05029 | FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below. | |
| International application No. PCT/AU2005/000248 | International filing date (day/month/year) 24 February 2005 | (Earliest) Priority Date (day/month/year) 25 February 2004 |
| Applicant RESMED LIMITED et al | | |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report
 - a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
 - b. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.
2. ☐ Certain claims were found unsearchable (See Box No. II).
3. ☐ Unity of invention is lacking (See Box No. III).
4. With regard to the title,

☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:
5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. With regard to the drawings,

☐ the figure of the drawings to be published with the abstract is Figure No. 2

☒ as suggested by the applicant.
☐ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2005/000248

| A. CLASSIFICATION OF SUBJECT MATTER | | |
|--|---|--|
| Int. Cl. ⁷ : A61M 16/00 | | |
| According to International Patent Classification (IPC) or to both national classification and IPC | | |
| B. FIELDS SEARCHED | | |
| Minimum documentation searched (classification system followed by classification symbols) | | |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched | | |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) | | |
| DWPI + keywords: CPAP, cardiac, oscillate and similar terms | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | |
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X | US 6,029,665 A (BERTHON-JONES) 29 February 2000 Column 4 lines 29 to 31 | 1-6, 8, 12, 25-30, 32, 36-42, 44 |
| Y | Chest, 1999 September, 116(3):660-666 "Cardiogenic oscillations on the airflow signal during continuous positive airway pressure as a marker of central apnea" Ayappa et al Whole document | 1-6, 8, 12, 25-30, 32, 36-42, 44 |
| Y | Anesth Analg, 1978 November-December, 57(6):647-652 "Automated measurement and frequency analysis of the Pneumocardiogram" Reitan et al Whole document | 1-6, 8, 12, 25-30, 32, 36-42, 44 |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex | | |
| * Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "B" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "Δ" document member of the same patent family | | |
| Date of the actual completion of the international search 15 March 2005 | | Date of mailing of the international search report 22 MAR 2005 |
| Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929 | | Authorized officer XAVIER GISZ Telephone No : (02) 6283 2064 |

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2005/000248

| C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|---|--|-----------------------|
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A | IEEE Trans Biomed Eng. 1981 June, 28(6):471-5 "The dynamic pneumocardiogram: an application of coherent signal processing to cardiovascular measurement" Johnson Whole document | |
| A | US 5,794,615 A (ESTES) 18 August 1998 Abstract | |
| A | WO 2002/026283 A2 (RESPIRONICS, INC) 4 April 2002 Abstract | |
| A | US 6,532,959 B1 (BERTHON-JONES) 18 March 2003 Abstract | |
| A, P | US 6,739,335 B1 (RAPPORT et al) 25 May 2004 Abstract | |

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU2005/000248

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

| Patent Document Cited in Search Report | | Patent Family Member | | | |
|---|---------------|----------------------|---------------|--|--|
| US 6029665 | AU 36787/99 | AU 55382/98 | AU 55383/98 | | |
| | AU 77641/94 | EP 0651971 | EP 0920845 | | |
| | EP 0927538 | EP 0934723 | EP 1488743 | | |
| | US 5704345 | US 6138675 | US 6363933 | | |
| | US 6675797 | US 2004123866 | | | |
| US 5794615 | AU 30801/99 | CA 2323455 | EP 1061981 | | |
| | US 5535738 | US 6105575 | US 6609517 | | |
| | US 2003121519 | WO 9945989 | WO 2004047621 | | |
| WO 0226283 | AU 93060/01 | BR 0114152 | CA 2421774 | | |
| | EP 1328305 | US 6752151 | US 2002088465 | | |
| | US 2004221848 | | | | |
| US 6532959 | AU 31211/99 | AU 37099/01 | AU 40236/99 | | |
| | EP 1083953 | US 2003154979 | US 2004237963 | | |
| | WO 9961088 | | | | |
| US 6739335 | | | | | |
| Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001. | | | | | |
| END OF ANNEX | | | | | |

PATENT COOPERATION TREATY

From the:
INTERNATIONAL SEARCHING AUTHORITY

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| To: Halford & Co. No 1 Market Street SYDNEY NSW 2000 |
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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

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| Applicant's or agent's file reference C05029 | | Date of mailing <i>(day/month/year)</i> 22 MAR 2005 | |
| International application No. PCT/AU2005/000248 | | International filing date <i>(day/month/year)</i> 24 February 2005 | |
| International Patent Classification (IPC) or both national classification and IPC Int. Cl.⁷ A61M 16/00 | | Priority date <i>(day/month/year)</i> 25 February 2004 | |
| Applicant RESMED LIMITED et al | | | |

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| <p>1. This opinion contains indications relating to the following items:</p> <p> <input checked="" type="checkbox"/> Box No. I Basis of the opinion <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application </p> <p>2. FURTHER ACTION</p> <p>If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.</p> <p>If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.</p> <p>For further options, see Form PCT/ISA/220.</p> <p>3. For further details, see notes to Form PCT/ISA/220.</p> |
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| Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929 | Authorized Officer XAVIER GISZ Telephone No. (02) 6283 2064 |
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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/AU2005/000248

Box No. 1 Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/AU2005/000248

| Box No. V | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | | |
|--------------------------------|--|---|-----|
| 1. Statement | | | |
| | Novelty (N) | Claims 2-24, 26-36, 38-48 | YES |
| | | Claims 1, 25, 37 | NO |
| | Inventive step (IS) | Claims 7, 9-11, 13-24, 31, 33-35, 43, 45-48 | YES |
| | | Claims 1-6, 8, 12, 25-30, 32, 36-42, 44 | NO |
| | Industrial applicability (IA) | Claims 1-48 | YES |
| | | Claims | NO |
| 2. Citations and explanations: | | | |
| | <p>The following documents identified in the International Search Report have been considered for the purposes of this report:</p> <p>D1.... US 6,029,665</p> <p>D2.... "Cardiogenic oscillations on the airflow signal during continuous positive airway pressure as a marker of central apnea" Aysappa et al</p> <p>D3.... "Automated measurement and frequency analysis of the Pneumocardiogram" Reitan et al</p> <p><u>Novelty (N) Claims 1, 25, 37</u></p> <p>Claims 1, 25, 37: D1 discloses a CPAP device which measures the oscillatory pressure waveform in a patient's air flow signal and analyses the signal for the presence of a component due to cardiogenic activity (see abstract). The patient's cardiac rate can be deduced from the oscillatory pressure waveform (column 4 lines 29 to 31).</p> <p><u>Inventive Step (IS) Claims 1-6, 8, 12, 25-30, 32, 36-42, 44</u></p> <p>Claims 1, 25 and 37 also lack an inventive step for the reasons given above.</p> <p>Claims 2-6, 8, 12, 26-30, 32, 36, 38-42, 44: The additional features of these claims would be considered workshop improvements in light of D1 to a person skilled in the art and consequently lack inventive step.</p> <p>Claims 1, 2, 25, 26, 37, 38: D2 discloses a method of measuring cardiogenic oscillations on the airflow signal during continuous positive airway pressure. D3 discloses the measurement of pneumocardiogram (PnCG), i.e., measurement of cardiogenic gas movement in and out of the lung during apnea, and correlates this with the heart function (see abstract).</p> <p>It would be considered obvious to a person skilled in the art to combine the features in D2 and D3 to arrive at the claimed invention and consequently these claims lack inventive step.</p> <p>Claims 3-6, 8, 12, 27-30, 32, 36, 39-42, 44: The additional features of these claims would be considered workshop improvements to a person skilled in the art in light of D2 and D3 and consequently lack inventive step.</p> | | |